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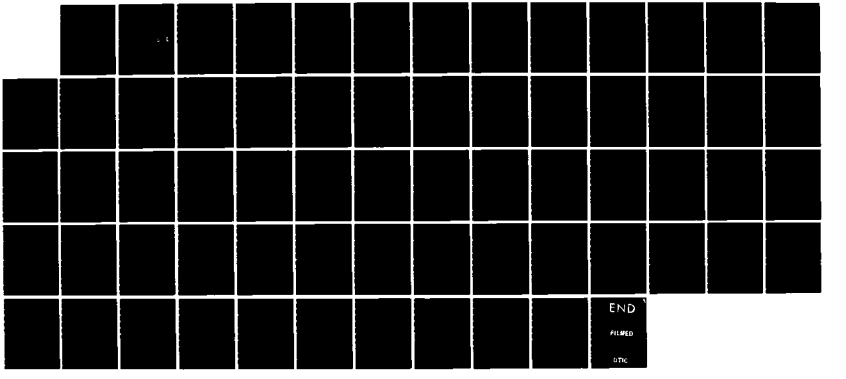

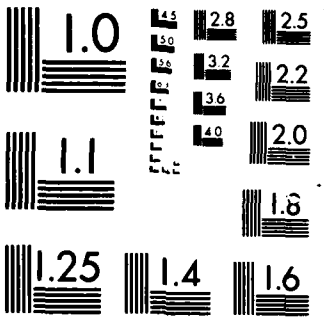

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USER FEEDBACK MECHANISMS

FOR

DEFENSE TECHNICAL INFORMATION CENTER

SERVICES AND PRODUCTS

PHASE I

Information Science Intern Project

Marcia Hanna

January, 1983

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This paper concerns the first phase of a project to design a set of survey instruments to obtain feedback on user satisfaction with DTIC products and services. Relevant formal user studies are summarized and current in-house efforts to obtain user input are outlined. OMB constraints on survey research are reviewed, as are research methodologies which appear appropriate to obtain user feedback. A survey instrument for use with demand bibliographies is proposed. Four additional procedures for product/service evaluation are recommended for the next phase of this project.

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ABSTRACT

This paper concerns the first phase of a project to design a set of survey instruments to obtain feedback on user satisfaction with DTIC products and services. Relevant formal user studies are summarized and current in-house efforts to obtain user input are outlined. OMB constraints on survey research are reviewed, as are research methodologies which appear appropriate to obtain user feedback. A survey instrument for use with demand bibliographies is proposed. Four additional procedures for product/service evaluation are recommended for the next phase of this project.

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INTRODUCTION

One of the responsibilites of the Office of User Services is to recommend product and service changes and additions. In order to suggest changes or additions, it is necessary to first determine how well the present line is serving the Defense Technical Information Center's (DTIC) users. That determination can only be made by the users themselves. Therefore, the agency must have mechanisms to survey its users to obtain feedback.

Surveying users can be beneficial for an agency, beneficial both in terms of the process itself and in terms of the information obtained from the process. The process of developing a collection instrument is in itself beneficial. It forces the researcher and the persons providing the product or service to stop and analyse what they do and how they go about doing it. Wide staff participation in the process of developing the feedback mechanism means that more people will learn from the process and will identify with the findings of the survey.

Obtaining user feedback tends to have a positive psychological effect on both staff and users. Staff should see this mechanism as a means to obtain an outside credible assessment of the value of their work. The work should, as a result, become a less impersonal process. Further, it says to the user that the agency is interested in providing good service and values his or her input. Contributing such feedback gives the user a sense of having an active role in providing for his or her own information needs.

The actual results of the survey should be beneficial to agency planners. From such results, they can learn more about the characteristics of users, characteristics of the products and services they want, which aspects of the existing system are satisfactory and which are not, the need for user education

services and how the agency is perceived in relation to comparable agencies. Having assessed user wants, agency personnel have evidence to show the need for actions which may be disruptive to the organizational climate. Such evidence from consumers should facilitate acceptance of the changes.

Finally, survey results can be very useful to management in an era of increased demand that agencies justify their expenditures. At one time it was acceptable for agencies to describe their activities to their oversight agencies soley in terms of output measures such as bibliographies shipped or even of input measures such as so many staff hours worked. This failure to justify products and services in terms of benefits to users is no longer acceptable. Agencies are now expected to be able to provide some evidence of an impact such as research hours saved because of knowledge of prior work. Similarly, one can argue more effectively that increased funding is justified if one can show systematic efforts to use funding in a cost-effective way.

There is, therefore, both a formal requirement and a substantive need for DTIC to have a set of mechanisms to obtain on-going user input as to the agency's products and services. Both the process of surveying users and the results of the survey are beneficial because they help to rationalize the work process, because they have a positive psychological effect on staff and users and because they contribute to management's ability to show that public funds have been used effectively.

There are important limitations on what user feedback can contribute. Surveys of user populations do not give direct information about non-users, who might in fact have as much or more than users to tell the agency about the value of its products. Another important limitation is the fact that user feedback will provide information only about conscious needs the user believes the agency can satisfy. The user may, in fact, have important needs of which

he or she is unaware. Additionally, the user may have conscious needs which are left unexpressed because he or she, correctly or not, believes the agency can not meet those needs. Further, the information provided by users will not meet stringent scientific criteria for comparability. The data themselves will be value judgements and are ordinal measurements at best.

Even if the data on user perceptions is accurate, it is unlikely to be accurate for a long period of time. User expectations are an everchanging product of awareness of needs and assessment of the resources available to meet needs. The changes in expectations may be slow but they will occur. Therefore, efforts to obtain user feedback should not be one-time exercises.

It is well to remember that the user's subjective assessment will be based on a number of factors, including:

1. The range of information sources available.
2. How the information will be used.
3. The individual characteristics of the user--motivation, professional orientation, experience in using information systems, etc.
4. The economic, political and social milieu of the user.
5. Results of having used the information.[2]

Clearly user assessments will be based on factors not entirely under the control of an agency. For example, the assessment of a demand bibliography will be based not simply on the search results per se, but also on the contents of the data base and the results obtained from using the primary literature referenced.[3] It may, in fact, be that users will want a level of service that is technically or economically impossible. Further, the user, feeling these needs acutely, may be "sometimes unable to understand why the secondary services producer cannot always come up with the proverbial goods".[4]

Information on the degree of user satisfaction will have no meaning in and of

itself. Such results can have meaning only as compared to the objectives of the organization. If a survey of users indicates that 75% of them are satisfied with the results of a search, that result will be good or bad depending on whether the objective was 50% satisfaction or 90% satisfaction.

The fact that funds are expended for user surveys implies to both staff and respondents that there is willingness to make changes that will be of tangible benefit to the users. However, the results of surveys will not of themselves mean an improvement in products or services. Changes come about because management decides that results are not consistent with objectives and has the resources and committment to implement a possibly very difficult change process.

In summary then, the development of survey instruments and the information which is gained from surveys should prove highly beneficial to the agency. The process itself will promote rational analysis of DTIC work operations. The results of surveys will aid product planners. User evaluations should promote job satisfaction because DTIC workers will have outside assessments of their work. Further, the evaluations will signal the user that the agency is concerned with meeting his or her needs. Of no small importance is the fact that user feedback is useful both in program advocacy and in the process of providing accountability.

Problem Statement and Approach

This project has been divided into two phases. The object of the overall project is to develop a comprehensive set of feedback mechanisms to measure the degree of user satisfaction with the various DTIC products and services. The specifics of the full set of feedback mechanisms will be considered during the second phase of the project. The steps which were taken during the first phase

are summarized as follows:

1. Review of previous studies which could be expected to shed light on the needs of DTIC users. These studies were reviewed both in terms of content with respect to user needs and in terms of suggestions for research methodology appropriate for this project.

2. Identification of the various ways, both formal and informal, that DTIC personnel are currently using to assess user perceptions of the agency's products and services.

3. Assessment of the ways in which formal constraints imposed by the Office of Management and Budget (OMB) could affect the agency's efforts to obtain feedback. The relevant laws and administrative determinations were examined. Several other information handling agencies were contacted to learn how they have coped with the constraints imposed on survey research.

4. Consideration of various social science research methodologies. Ones that appear suitable for use in measuring DTIC user perceptions are briefly described.

5. Presentation of a possible user evaluation form. As a first step in the developmental process, a user evaluation form for demand bibliographies is offered together with a plan for data collection and analysis.

6. Finally, recommendations are made concerning the wider set of feedback mechanisms to be developed during the second phase of the project.

EFFORTS TO MEASURE USER NEEDS AND PERCEPTIONS, 1965 TO DATE

Formal Studies

In 1963, Alan Rees observed that the information retrieval field had been plagued for many years by busy people spending large sums of money designing--or attempting to design--phantom systems for nonexistent people in hypothetical situations with unknown needs.[5] Once information scientists realized that one of the most difficult problems confronting their field was the determination of the true nature of user needs, there was a concerted effort to study the user in the work setting Three of the following efforts--Auerbach, 1965; North American Aviation, 1966, and Auerbach, 1975--examine the needs of the DoD researcher and engineer and have become classics in the user study genre.

On the other hand, the work of the Committee on Information Hang-Ups, 1975, was an attempt by working information professionals to describe the ways that DTIC could best serve the user. The 1980 work by the Institute for Defense Analysis focused on the ways that classification of part of the data base affected service to users. Finally, the Proceedings of the DoD Technical Information Conference, 1981, reflect the views of a group of managers concerned first with the DoD-wide information program, and secondly, with DTIC's contribution to that program. These studies differ in their approaches but all contribute to the knowledge base concerning the needs and perceptions of DTIC users.

Auerbach Corporation, DoD User Needs Study, Phase I, 1965

The purpose of this DoD sponsored study was to develop a comprehensive picture of the information seeking patterns of the DoD RDT&E community, a

heterogeneous, inter-disciplinary population performing a wide variety of tasks.[6] Since there was relatively little prior knowledge about the characteristics of this population, a random rather than a stratified sample was chosen. A simple random sample of 4% of the population was taken. In-depth interviews were conducted by trained interviewers at the user's site.[7] The interviewers used a semi-structured guide intended primarily to remind them of the intent of the questions.[8]

The study was deliberately designed to avoid the measurement of opinion. That is, the researchers wanted to find out what kinds of information were actually used and deliberately avoided questions which might produce comments on the kinds of information service the user might like to have. A recently completed task was isolated and the characteristics of the information actually utilized in the performance of the task were ascertained.[9]

This technique produced a large body of data concerning the characteristics of the population, the tasks they performed, the information they gathered to perform tasks, and their use of information services.[10] The respondents were found to be well-educated, mainly civilian, half of them engineers, and a quarter physical scientists.[11] This community was found to be involved in a wide variety of tasks with the greatest emphasis in engineering. The major task output was a finding or a recommendation rather than a decision, and the task results were usually reported in writing.[12]

The primary emphasis in the interviews was on the characteristics of the information which was acquired and on how it was used. They found that the class of information most frequently used was performance characteristics and specifications (42%). Approximately a third of the respondents reported seeing only one item of the available material, another third a sampling and only 16% believed that they had had access to all the available material. Seventeen

percent could produce no answer to this question on the degree of recall from the relevant knowledge base.[13]

When asked if they would have found title listings or abstracts useful to read before selecting materials, 16% replied that such aids were used already, and 53% replied that search aids would be useful. However, 31% believed that such aids would not be helpful.[14]

Colleagues, personal files, and local departmental sources were the first sources consulted in more than half the searches for information. Oral communication was found to be an important mode of acquisition and the technical report was the most frequently used written medium (16%). The users far more frequently wanted a specific fact or a detailed analysis such as a state-of-the-art review rather than a bibliography or a series of abstracts. While only a minority of the respondents reported having difficulty finding information, this 27% minority is in fact a sizeable minority, and furthermore, the user may very well have had signficant information needs of which he or she was unaware.[15]

A finding with very direct implications for DTIC was that the formal DoD information system of technical libraries, information analysis centers, and the then Defense Documentation Center (DDC) was not widely used. One reason for this underutilization, was found to be a lack of awareness of the existence of these services. The researchers suggested that this lack of awareness should be attributed to a lack of effective publicity. They further suggested that another possible reason for low usage might be that the formal system did not have the convenience, responsiveness, and interactive qualities valued by users.[16]

These researchers concluded that their results demonstrated the importance of the local environment and confirmed the existence of an informal information

system in the DoD RDT&E community. They recommended that the local and informal systems be strengthened by the development of local skills directories and the improvement of the personal files maintained by the various members of the technical community. To improve the formal information system, they recommended a public relations program to enhance the awareness of the end user of services such as the then DDC and information analysis centers. They further recommended the development of comprehensive training programs and user's guides for intermediaries such as local librarians. As for the contents of the formal data bases such as those at DTIC, they recommended that greater emphasis should be placed on handling engineering data such as performance characteristics and specifications.[17]

North American Aviation, DoD User Needs Study

Phase II, 1966

Phase I of this study concerned the information needs of personnel employed by DoD. Phase II of the study, performed by North American Aviation (NAA), investigated the information needs of similar personnel in the defense industry. Like the AAI study, the NAA work is based on a large, random sample. The sample, in this second case, consisted of 1,500 persons from 83 organizations.[18] Like Phase I, this phase also used the critical incident technique to focus response on specific actions as opposed to user perceptions. The interviewing technique appears to have been much the same.[19]

Like their DoD employed counterparts, contractor respondents found that engineering data was the most important category of information, specifically performance and characteristics data and specifications. There was slightly more emphasis by contractors (48% of needs v. 42% of needs) on the fields of electronics and electrical engineering, and aeronautics and space technology.

Somewhat fewer contractor personnel found the local work environment the most important first source for information (50% for contractors v. 60% for DoD), but a greater proportion (46% v. 39%) had their information needs fully satisfied by local sources when those sources were the first ones contacted. When using formally organized sources, there was very heavy reliance by members of both groups on the sources such as departmental files in the local environment. The results of both Phases I and II point up the importance of information analysis prior to distribution. Both communities of researchers wanted to be provided with specific answers and detailed analyses.[20]

DoD information centers and services were found to be underutilized by both DoD and industry personnel, with only about 45% of both samples using those resources. Approximately one-fifth of DoD workers were unaware of DDC's existence as were almost one-third of the contractor employees. Practically the same proportion of DoD personnel as contractor personnel were unaware of the Technical Abstract Bulletin (TAB), i.e., 40% v. 43%. More contractor personnel (42% v. 27%) had problems in acquiring information, and 35% attributed problems to security restrictions or proprietary limitations. Approximately a fifth of contractor personnel found additional task information after the task was completed.[21] NAA further learned that use of information services is interrelated, e.g., users of TAB are likely to be users of other services.[22]

Based on the results of their study, NAA researchers made the following recommendations to the managers of the DoD information programs:

1. Priority of effort should be given to information which is in the development phase and which is related to design and performance in electronics and electrical engineering and in aeronautics and space technology.

2. Local sources of information should be strengthened by (a) making more readily available information which is informal or semiformal in composition, (b) tailoring indexing, abstracting, organization and analysis of information prior to its distribution, and (c) by selective and automatic dissemination of these tailored indexes, abstracts, and of organized and analyzed information.

3. More effort should be addressed to satisfying the information needs of the significant users of DoD information, whom they found to be scientists or engineers in R&D, holders of advanced degrees, specialists or at lower management levels, who are highly paid, that is, the class of persons who appear to be the greatest users of information centers and services and the ones most frustrated in their efforts to use these sources.[23]

Auerbach Associates, DDC 10 Year

Requirements and Planning Study, 1975-76.

During the mid-1970's, Auerbach Associates, Incorporated (AAI), were again engaged to study the information needs of the DoD community. They were specifically contracted to:

1. Identify information requirements for the time from 1978-1988.

2. Identify end-user problems with respect to services provided by DDC and other sources.

3. Evaluate DDC's internally established long-range objectives in relation to the findings of the study.

4. Formulate a set of developmental goals for 1978-1988.

5. Describe DDC's role in the information community.[24]

To study user requirements and problems, AAI conducted a survey of users and potential users using mailed questionnaires and a highly structured schedule for telephone interviews.[25] In contrast to its 1965 study, AAI this time used a stratified sampling plan with random sampling within strata.[26] The schedule was designed to produce data on the user's primary sources of

information, preferred formats and media, attitude toward user charges, awareness of DDC products and services, perceptions of the various data bases and information analysis centers, need for training, current problems in obtaining information and predicted requirements for 1978-1988.[27]

AAI also surveyed fourteen federal information processing agencies selected for their relationship to DDC.[28] The expert review technique was used to develop a set of time-phased assumptions about future technological, organizational, and economic conditions as they could impact on the information system.[29] These three approaches produced a considerable body of data supporting the researchers' conclusions concerning the services and proposed plans of the agency. Three over-arching goals were recommended for DDC:

1. Maximize the potential for coordinating the RDT&E information program in DoD.
2. Provide new and improved products and services.
3. Market those information products and services.[30]

The AAI recommended effort which is of special interest for the present purpose is Objective II-2 which called for the agency to "establish a means of obtaining user feedback for improvement of DDC products and services."[31]

Committee on Information Hang-Ups, 1975

About the same time as the AAI study, a less formal effort was being carried out. In 1974, the Administrator of DDC challenged the Committee on Information Hand-Ups to provide substantive input into that agency's ten-year planning study. From the membership of the committee, four working groups were assembled to:

1. Evaluate existing services.
2. Identify the information available within the users organization.

3. Identify the relationships in the DoD information chain.

4. Take a long-range view of the information program in DoD.

In contrast to the report produced by the specialized research personnel employed by AAI, this report was produced by persons in the DoD information environment who continued to carry full workloads within their own organizations.[32]

The working group to evaluate the various DDC services developed questionnaires and distributed them to members of the Committee on Information Hang-Ups and to certain users of specific services. Based on responses to those questionnaires, Subcommittee I, concluded that:

1. DDC users were not as well informed about DDC services as they believed themselves to be.

2. DDC users believed that if they were to pay for services, they were entitled to services of high quality.

3. That the Work Unit Information System (WUIS) data base was valuable and deserved DoD insistence on much more complete input.

4. That half of DDC's efforts should be directed toward experimental programs.[33]

After studying the flow of information in DoD, Subcommittee II concluded that DDC should direct the flow of information from the center toward the user's library rather than toward the end user himself or herself.[34] Subcommittee III recommended that the center expand its user education program emphasizing specialized services such as the Information Analysis Centers (IAC). The members of Subcommittee IV looked within their own organizations and identified problem areas related to lack of familiarity with DoD and DDC services and the need for a coordinated information program.[35]

The committee as a whole produced a number of specific recommendations for DDC, recommendations which can be categorized under the need to:

1. Provide continuing education for DoD information personnel.
2. Promote networking among federal information services.
3. Support innovative technology.
4. Promote standardization.
5. Lobby for the free flow of technical information.[36]

Institute for Defense Analysis, 1980

In late 1979, the Institute for Defense Analysis (IDA) undertook to study ways to improve access to DoD information through the DTIC data bases. The study was to consider, in part, the principal objectives involved in the design and operation of on-line data base systems, to survey a sample of DROLS users to obtain their reactions to the proposition that DROLS become an unclassified system, and to examine the utility of information available from DROLS.[37] The IDA researchers surveyed 28 individuals at 11 organizations.[38] Interviews were set up by telephoning the person listed as the DTIC contact in a list of DROLS terminal sites. This person, usually an information source person, was sent a packet of materials and questionnaires. After the contact had been given time to examine the materials, he or she was contacted and asked to line-up two other persons for interviews, one a researcher and one a research manager. Of the actual interviews, more than half were librarians or information specialists.[39] The conclusions which could be drawn from the study were limited by the fact that the opinions of non-users were not sought. Further, the hetrogeneous character of the organizations employing the respondents and the small size of the sample prompted the researchers to caution against too much generalization from their results. Nevertheless, they felt they had identified

the major needs perceived by most DROLS users.[40] The gist of most of the respondents comments was that DROLS should operate more like the commercial on-line systems.[41]

From their review of the pertinent documentation and their survey of users, the IDA researchers identified what they considered a discontinuity in the DTIC mission. That is, DTIC is committed to facilitate the transfer of information in the DoD/contractor community while at the same time, it must also control and protect classified data. The first commitment implies *flexible inexpensive* access and compatibility with networks and other retrieval systems while the second aspect of the mission requires control, expense, complexity and incompatibility with other systems.[42]

While they concluded that real advantages would be obtained by the declassification of DROLS, the IDA group found that classified users were so strongly opposed to such change that the group recommended that no such change be made.[43]

DoD Technical Information Conference for R&D Managers, 1981

While not a study in the sense of the items previously described, the deliberations and conclusions of the DoD Technical Information Conference for R&D Managers (1981 at Ft. McNair) can offer useful insight into the proper direction for DTIC efforts. The primary purpose of the conference (sponsored by the Deputy Under Secretary of Defense for Research and Engineering) was to bring together a large cross-section of DoD in-house and contractor scientists, engineers and technical managers to assist in planning the DoD information program.[44]

Although it was not described as such, the approach could be likened to the research technique termed the "expert panel review." The conference of some 90

persons produced a number of recommendations for action directly related to DTIC:

1. DTIC should be designated as a major element of the defense STIP.

2. DTIC should develop a data base locating all DoD sponsored technical reports.

3. DTIC should develop a system to evaluate the agency's technical report collection including evaluation of subject areas for balance and completeness of input.

4. DTIC's ability to maintain classified data bases should be retained and enhanced.

5. DTIC should work with the military agencies to improve access by contractors to specifications, etc., required to respond to requests for proposals and bids.[45]

King Research, 1983

In 1981, King Research, Inc. was engaged by DTIC to survey a part of that agency's users. The survey was conducted and the data has been at least partially analyzed. The final report, however, was not available at the time this report written.

As indicated by the formal studies described above, a variety of approaches can be taken to gain understanding about what DTIC users need and want. It has not been possible to implement all the recommendations in these studies. However, many suggestions - such as those concerning resource sharing and dial-up access - have been implemented. As valuable as the formal studies proved to be, they were discrete efforts and DTIC must have recurring user feedback particularly for certain products and services. DTIC's efforts to obtain that recurring feedback are described in the following section.

In-House Efforts to Obtain User Feedback

On-Going Operations

The various directorates have established mechanisms which as part of on-going operations, provide user feedback in varying degrees of formality. DTIC Form 141, "Bibliography Evaluation Form" (see Appendix B), is probably the most structured mechanism. The Directorate of Data Base Services (DTIC-T) uses this form which focuses on an overall evaluation of the results of the analyst's search. It is additionally intended to produce an estimate of the time, manpower and money saved by knowledge of prior efforts. These forms, which have been in use for some ten years, accompany approximately 20% of the bibliographies sent to DoD users. They are not presently sent to contractors owing to OMB constraints.[46] Respondents return the self-addressed and prepaid forms to the Directorate of Planning and Management (DTIC-M) where they are retained for two years.

DTIC-M analyzes the forms particularly in terms of stated cost savings.[47] Examination of the DTIC Forms 141 in the DTIC-M files for the first half of 1982 suggests that the return rate is quite low and that a disproportionate number are returned by a few individuals. For example, of the 33 forms in the file of February, 1982, 18 were returned by one person. To the extent that user complaints via the Form 141 are focused, that dissatisfaction seems to center on a perceived lack of relevance of the searches to the user's needs.

The Current Awareness Bibliography (CAB) section obtains its feedback informally when users telephone to discuss their profiles. No record of this feedback is maintained. In addition, the annual CAB recertification process acts as a feedback mechanism.[48]

DTIC-T uses DTIC Form 345, "DROLS Training Evaluation," to gain user feedback on the content, format and presentation of online class training. In

addition to the two evaluation forms, user telephone calls and the recertification process, the management of DTIC-T also recognizes the importance of feedback received through user conferences and the User Services Office.[49]

The formal feedback mechanism for the Directorate of Document Services (DTIC-D) is the position identified as "Complaints and Inquiries Processor." This position was created to resolve routine operational inquiries regarding problems such as mispulls from storage, misshipments, and duplications of orders. A monthly summary of user complaints is forwarded to DTIC-M. Records of the specifics of the complaints are destroyed in DTIC-D after six months as it is believed that six months is the maximum time period for corrective action. The former incumbent of this position says that many of the user calls are not complaints in a negative sense but are simply requests for corrective action. She also believes that much of the user feedback coming to this focal point fits into categories already addressed by agency procedures.[50]

The project manager for the Automatic Distribution of Documents (ADD) program tries to talk to each of the program's 200 or so customers at least once per year. He encourages them to review their profiles and check their shipments to determine whether they reflect their real needs. When users perceive problems, those problems are usually related to the finer nuances of DTIC indexing.[51]

In the Directorate of ADP Systems (DTIC-S) the main means of obtaining on-going user feedback is a particular telephone number which users have been encouraged to call when they need immediate action, e.g., they can not activate a terminal or can not get a security log at the close of a session. The emphasis here is on solving the problem at hand and no log is kept of the problems presented.[52]

DTIC-S has no feedback forms per se, but does occasionally participate in special studies. For example, in December, 1981, the directorate's Management Support Office (DTIC-SM) and the DROLS Users Council asked selected users to time the interval between their transmission and return of the cursor to the screen.[53] In another instance, in March, 1982, DTIC-SM wrote to sites which had not activated during 1981 requesting feedback on the possible reasons for non-use and encouraging them to contact DTIC if they were experiencing problems or needed further information.[54]

During the 1960's and much of the early 1970's, DTIC had an active Customer Relations Office. Staff members were available for on-site consultations concerning the mission, procedures, and services of DDC.[55] Additionally, this office provided briefings and tours to visitors to the center. The identification of needed modification in DDC products and services was another responsibility of this office.[56]

During an organizational realignment the duties of the Customer Relations Office were disbursed throughout the agency. However, the need for a well-coordinated user liaison program was apparent (see AAI, 1976) and in 1981 the function was recentralized in the present Office of User Services (DTIC-V). DTIC-V's responsibilities include setting up a liaison program; preparing the DTIC Digest, user guides, and promotional materials; operating the DTIC regional service facilities; and coordinating with and supporting user groups. This office is also responsible for devising means to obtain user feedback and for analyzing that feedback.[57] Current efforts of this office will be noted in connection with the description of feedback mechanisms of longstanding such as user conferences.

From time to time, in-house personnel have made special studies not connected with on-going operations. For example, in 1979 as an intern

project, Cotter, Howes, and McCleery distributed a questionnaire to attendees at regional user conferences. Based on the responses of 44 subjects (56% response rate) they concluded that many users lacked knowledge about the DDC system but that the shortcoming was not "due to apathy about DDC or to naivete concerning on-line systems but more probably reflected the agency's failure to promote its products and services."[58]

Contact with Organized Groups

Contact with professional societies and user groups is a widely accepted technique for promoting an organization's services and for obtaining customer feedback. For example, DTIC has used the annual conferences of the American Library Association (ALA) and the Special Libraries Association (SLA) as occasions to present exhibit booths. Such booths provide an opportunity to demonstrate DTIC services to a nationwide audience and obtain feedback from a wide range of users and potential users.[59] Similar exhibits were also presented at the last two national conferences of the American Society for Information Science.[60] Active participation in the Military Librarian's Association and in that group's annual workshop provides another particularly useful means to encourage the DoD information community to see the agency as an approachable institution.[61]

Another organization which has been particularly useful to and supportive of DTIC in its efforts to communicate with users is the Committee on Information Hang-Ups. This group of experienced, Washington-based information specialists began to meet in 1969. They gathered together to discuss solutions to problems encountered in use of the agency's services. After conducting a user survey and producing a report titled "Information Hang-Ups: Problems Encountered by Users of the Technical Information Services Offered by DDC and CFSTI", the group continued to meet and became known as the Committee on Information Hang-Ups.

The group has remained an important vehicle for communication between the agency and a significant segment of the agency's user population.[62]

Decisions such as the abolishment of regional offices, charges for document copies, and classification of TAB plus the success of the Committee on Information Hang-Ups in Interacting with DDC management promoted the creation of regional user groups.[63]. DDC management saw such groups as a useful means of obtaining feedback and encouraged them. By 1971, 40 of these groups had been formed.[64]

Many local groups dissolved but by 1978 several regional groups still survived. In that year DTIC representatives met with users at Northeastern, Southern, and Western Regional Conferences. At these meetings, users provided the agency with feedback on their redesign requirements, on the need for IAC data to be made available to all users on-line, reorganization of training manuals, and the declassification of TAB. Additionally, they provided a critique of the previous annual conference, calling for better meeting facilities, better preparation by workshop leaders, and less overall formality. They also said that the time allotted to users to meet without DDC personnel present was valuable and should be continued.[65]

The following year also saw three regional user conferences -- in New Mexico, Florida, and in Massachusetts. That year's conferences produced feedback emphasizing the user's requirements with respect to the on-line system files and formats.[66] Three regional meetings were held in 1980, again in Florida and Massachusetts, and a third in California. That year users expressed concern regarding interruptions of displays and prints, delays in receipt of batch products, and the progress in revision of the training manual.[67] In 1981, five regional conferences were held -- in California, New Mexico, Florida, Massachusetts, and Virginia. These conferees were polled on their reactions

to truncation of technical report abstracts and were reminded to submit DROLS trouble reports and to contact the on-line support office when experiencing problems with NTIS billing.[68]

The recently established Office of User Services, DTIC-V, views the regional conferences as a planned continuation of the user interaction and feedback established at the annual users conferences. DTIC-V sees these gatherings as an "opportunity for interacting with as many users as possible on progress made on their requirements, on new policies and procedures, to react to user problems and questions . . ."[69] and to gain significant feedback which is "very useful to DTIC in adjusting its range of services and developmental plans."[70]

Six of these regional user conferences were held in 1982. At these meetings the users reported to DTIC their concerns regarding cancellation of the Program Planning Data Base, slowness in limited document release, input procedures for the Shared Bibliographic Input Network (SBIN), technical report request turnaround time and on-line response time.[71]

DTIC users have organized not only on a geographic basis but also around areas of interest, i.e., the on-line retrieval system and SBIN. At the 1978 annual conference DDC suggested that the on-line users organize themselves to voice user needs to the agency.[72] Volunteers gathered to form a steering committee and agreed to begin at once to review the redesign functional description, review and consolidate the user requirements developed at regional meetings and urge DDC to return the on-line system to full-day operation.[73]

These volunteers kept in contact and at the 7th Annual DROLS Users Conference in 1980 a group of government and contractor users was officially organized, to be known as the DROLS Users Group. The group elected an eleven member council to represent the interests of the military services, other DoD

agencies and the contractor community. The council was to be the channel for the larger group to make recommendations to DTIC concerning matters such as search capabilities, telecommunications, security hardware and document delivery.[74] The council has been active, keeping DTIC aware of problem areas such as incomplete input into data bases, slow response time and misdirected mail.[75]

The participants in SBIN have also chosen to organize a user group. This group, the Resource Sharing Advisory Group (RSAG), was established with DTIC encouragement to recommend to agency management mutually beneficial resource sharing initiatives.[76]

The first DROLS Conference, held in 1973, initiated a particularly useful dialog between DDC DROLS specialists and on-line users. The conferences gave users an opportunity to interact with and learn from each other, to receive training from agency personnel, and increasingly over the years, to provide the agency with input on user needs. For example, the 1978 annual conference was described as "well-attended with users participating freely and providing meaningful dialog."[77] That year users complained that some computer operators released and reactivated them unnecessarily causing loss of user file information, that they were slow in reacting to console messages and that some operators were rude. On the other hand, the operators complained that some users were very demanding and failed to follow proper procedures.[78] Other users' concerns related to updating of training manuals and the need for a directory of persons having expertise in particular areas.[79] Shared Bibliographic Input Experiment (SBIE) participants that year expressed a need for a data element to identify site entries and holdings in the Technical Report data base. The site representatives wanted this data element so that they would have the capability to create online catalogs of the various sites'

holdings.[80] Subsequent conferences have produced feedback on, for example, users' desires for more convenience and on-line help in searching, greater standardization, and more current terminology for indexing.[81]

Since 1981, the annual users conference has been coordinated by DTIC-V and beginning that year the scope of the meetings has been expanded to include users other than DROLS sites. The final portion of the conference has, of late, been given over to a "Conference Wrap-Up/Question Answer Session" in which DTIC managers respond directly to questions and comments by attendees.[82] This format has been very well received by the participants. Overall, these national conferences have been very successful, and in 1981, the director of the Defense Logistics Agency (DLA) described the annual conferences as "DTIC's best opportunity to review with its prime users the effectiveness of its services and to develop suggestions for improvements."[83]

The in-house efforts described in this section are serious attempts to obtain accurate user feedback on the value of DTIC products and services. In point of fact, these methods probably do give the majority of DTIC managers fairly realistic impressions about how well certain products and services are meeting the needs of assertive DTIC users. However, it should be possible for all managers to have trustworthy information about how well they are serving the entire population of DTIC users. If DTIC managers are to have this vital information, then the agency as a whole must systematize efforts to obtain user feedback.

OMB CONSTRAINTS ON SURVEY RESEARCH

The Office of Management and Budget (OMB) is responsible not only for developing and administering the federal budget but also for monitoring the management practices of federal agencies. In December, 1980, President Carter signed a largely unpublicized piece of legislation, the Paperwork Reduction Act (Public Law 96-511), which considerably enhanced OMB's power to control other federal agencies by controlling the flow of information into and out of the federal government. Federal agencies were generally displeased by PL 96-511, a fact that did not disturb the bill's major supporters. The bill's sponsor, Congressman Jack Brooks, remarked that "this bill has made a lot of folks real unhappy and I think that's just fine."[84] The man credited with much of the behind the scenes work on the bill, Jim Tozzi of OMB, was asked if the Paperwork Reduction Act meant that OMB would have control over all information going out of the government. He replied: "Yes, but that's not the important part. We will also control all the information coming into the government."[85]

Some observers believe that the bill might be made meaningless because Appropriation Committees might not appropriate sufficient funding for enforcement. Others see a danger in uneven enforcement, a contingency which is in fact accepted by the act.[86] Whatever the substantive merits of the bill and the hazards of its implementation, it is in fact in force in DoD and must be complied with in collecting information from the public.

The law establishes within OMB an Office of Information and Regulatory Affairs to be administered by a Director, empowered to develop and implement federal information policies and to review and approve information collection requests.[87] The act states in part that its purpose is to minimize the federal paperwork burden for individuals and businesses and to minimize the cost

to the government of collecting, maintaining and using information and to maximize the usefulness of the information collected by the federal government.[88] The act specifically includes military agencies.[89] It defines the term "burden" to mean the "time, effort or financial resources expended by persons to provide information to a federal agency."[90] The term "collection of information" means:

> . . . the obtaining or soliciting of facts or opinions by an agency through the use of written report forms, application forms, schedules, questionnaires, reporting or recordkeeping requirements or other similar methods calling for . . . answers to identical questions posed to, or identical reporting or recordkeeping requirements imposed on, ten or more persons, other than agencies, instrumentalities, or employees of the United States.[91]

The term "person" is defined to include all types of businesses and associations.[92] DTIC's capacity to query its users in the contractor community is thus very explicitly constrained.

If DTIC is then to obtain formal, continuing feedback, it must submit a Standard Form 83A, "Clearance Request and Notice of Action." The clearance request should be submitted as part of the DLA annual Information Collection Budget (ICB). The ICB is an estimate of the total number of hours required of the public to comply with requests for information. DLA-CM expects to call next for submissions for its ICB in May, 1983. OMB hearings on the ICB and the various information collection requests accompanying it are held in July and August.[93]

PL 96-511 states that OMB has 60 days after receipt of a request (plus 30 days extension with notice) to approve or deny approval of an information collection request. If the requesting agency receives no notification after 90 days, approval may be inferred, a control number assigned and the agency may collect the information for not more than one year.[94]

Several information handling activities were contacted to learn how they were obtaining user feedback in light of these constraints. Only one, the National Criminal Justice Reference Service, reported having tried and been successful with the OMB clearance process. It took them approximately three months to get OMB clearance for a survey instrument.[95] It appears that other agencies tend to either rely entirely on some of the less structured means to obtain user feedback or continue to use old survey instruments but not send them outside the federal government. For example, the Capitol Systems Group no longer makes any direct survey efforts. They believe the problems involved in getting clearance are too great. Instead they use other indirect ways such as face-to-face contact at exhibit booths at national meetings. Additionally, user initiated phone calls may be used by Capitol Systems to inquire into areas where feedback is needed. They also believe in the value of holding workshops and demonstrations at the less obvious conferences. For example, they might appear at a meeting of the American Association of Small Research Companies as opposed to ASIS. They maintain that these indirect methods are good ways to get ideas and sound impressions but acknowledge that these means do not provide data in a form that is amenable to analysis.[96]

The National Aeronautics and Space Administration (NASA) Scientific and Technical Information Facility continues to use evaluation forms for its searches done both in-house and at remote sites. These franked, return addressed forms are part of the transmittal package and are returned at about a 15% rate.[97]

The Department of Energy (DoE) Technical Information Center relies heavily on person-to-person contact to obtain feedback. Center representatives hold briefings in the field, attend meetings at other agencies and host user meetings. All of these means, unfortunately, involve travel. They also

announce proposed product changes, such as division of a journal into more narrowly defined areas, and, as part of the announcement, call for user comment. They consider their annual recertification process a feedback mechanism. The recertification letter is accompanied by fact sheets about the various services and these fact sheets request user comments on the services described. The Technical Information Center believes that by these indirect means they are obtaining credible information on how well their services and products are received.[98]

The National Technical Information Service (NTIS) Customer Relations section also relies heavily on person-to-person contact. This contact is achieved mainly by attendance at meetings of organized groups such as ASIS and SLA. NTIS has recently initiated a campaign to establish a nationwide network of contacts with the special library community. Ruth Smith, Chief, Office of Customer Services, travels to meetings of SLA chapters to present information on NTIS. At the meetings she encourages group discussions in which librarians produce straightforward assessments of NTIS services and positive suggestions about how NTIS can better serve them. Smith believes that a user group can be especially helpful in view of present OMB constraints if that user group chooses to conduct research surveys in areas of concern to NTIS. Additionally, the fact that there exists an Office of Customer Services attached to NTIS management signals to users that NTIS is an approachable agency which will listen to advice.[99]

Users of these unstructured methods probably are obtaining largely accurate impressions of how well their services are being received. However, study of the guidance on how to request clearance from OMB using the Standard Form 83A suggests that the process may in fact be less formidable than it would at first seem to be. There appear to be no OMB requirements, in terms of design of

research or in design of survey instruments, which are not consistent with standard research methodology. Quite possibly the most burdensome aspect of the clearance process would be the time delays involved. Since the OMB guidelines appear reasonable in terms of criteria for research design and since DTIC needs to have the capability to query the entire range of its users, it would be worthwhile for the agency to develop survey instruments which OMB will find acceptable.

INFORMATION MODEL

To choose among the various options for data collection, one must first be aware of the actual reasons for doing a survey. For example, is the feedback from a search evaluation to be used to formulate indexing policy or is it to gather testimonials to use in budget justifications? Both are worthwhile purposes but presumably the former would require more rigorous instrument design and sampling technique.

Certain standard social science research methods were rejected as unsuitable for the present purpose. For example, experimental design was rejected because it is most suited to measure the actual effects of change as opposed to perceptions of a condition such as slow response time or of an entity such as TAB. Experimental design might at some time be used if DTIC managers wanted to measure the effects of a new product or service. However, experimental design will not be further considered in this report.

Direct observation of behavior is a costly method which is particularly recommended for studying perceptions about sensitive or controversial matters. This method was rejected both because of cost and because perceptions about information services are relatively impersonal. The diary method and the critical incident method were also rejected because they are costly and are most suitable for measuring the specifics of individual behavior. The approaches to be considered here are all forms of self-report. They vary in their degree of structure and in their mode of administration but all are ultimately dependent on the participation and openness of the respondent.

Questionnaires

Self-administered mailed questionnaires are inexpensive to send out and they save on interviewer fees and travel. They may be inexpensive overall

provided design and follow-up costs are contained. Another advantage of the self-administered questionnaire is that it is frequently easier to achieve a more representative sample. At least one has the opportunity to solicit response from a representative sample, for example, to mail questionnaires to randomly selected user codes. By contrast, the element of self-selection would enter if the same set of questions were distributed at a user conference. Additionally, respondents may be more frank when filling in an impersonal form than when face to face with an interviewer. The potential problem of bias based on personal interaction is avoided by the self-administered questionnaire. Similarly, the mailed questionnaire gives the respondent an opportunity to assemble data if such is necessary and gives him or her time to produce considered answers.[100]

While the mailed questionnaire method can be inexpensive compared to many other methods, there are serious problems associated with it. The bias introduced by a low response rate can seriously mar conclusions drawn from the data because persons who voluntarily complete a questionnaire frequently have characteristics different from those who do not.[101]

Generally speaking, the mailed questionnaire should not be used unless the questions are clear-cut and unless a high response rate can be anticipated. Questionnaires should be as brief as possible, asking only for the minimum information required, and asking only questions that can and will be answered truthfully. One should avoid jargon and ambiguity. If concepts are complex, e.g, relevance v. recall, explanations will be necessary and the researcher should be aware that many respondents will skip a lengthy explanation and record an inappropriate answer. Several questions should not be disguised under one question and the designer should avoid asking respondents about events distant in time. Generally, the questionnaire should ask about typical behavior rather than behavior during an arbitarily selected time period. Questions should be

phrased neutrally so as to protect the respondent's self-esteem. Either closed or open-ended questions may be appropriate but the designer should be aware that subjects are less likely to respond to open-ended questions and that while open-ended questions can be coded, the coding process will add to the cost of analysis. Similarly, either general or specific questions can meet the need. For example "Were the results of your last search relevant to your needs?" may be adequate. However, "Did you obtain and read any of the items identified on your last search?" adds a greater degree of specificity.

One should try to present a question sequence that is natural for the respondent and particularly the first few questions should seem important to the respondent. Open-ended questions should be at the end to avoid tiring the respondent before other data is gained. Visual quality affects response rate and one should seek the strongest possible sponsorship for the survey. One should emphasize the importance of the study or evaluation to the respondent's own interests--e.g., explain that the purpose is to better tailor bibliographies to the requester's needs. If it seems practicable to do so, one should offer to make known to respondents the results of the survey, perhaps through the Digest or announcement at an upcoming conference.

Unless a high response rate is obtained, researchers should follow-up with a sample of non-respondents so as to learn if there are signficant differences between respondents and non-respondents. The costs of follow-up may, however, be great enough to offset the intial low costs of the mailed questionnaire. King and Bryant advise that "it is almost always best to reduce the overall sample size and insure high response rate by follow-up."[102]

Interviews

Inaccessibility of respondents is a problem that pervades this method. The problem may vary from the person who is difficult to reach on the telephone to

the larger problem of bringing a group together. One-to-one interviews may be carried out in person or by telephone. Telephone interviewing avoids travel costs, an important advantage. The absence of visual contact may be a problem since the interviewer has no non-verbal clues as to the respondent's comprehension of the question. On the other hand, lack of visual clues may lessen distortion created by interaction between respondent and interviewer.

The structured one-to-one interview is actually much like the mailed questionnaire. It should be as carefully designed and the interviewer should be passive. Quantification is still relatively easy because of the structure but there is considerable danger that opinion will be recorded inaccurately using this method because of forced categorization, especially if the respondent's views are not crystalized.[103]

The face-to-face interview is a very flexible way to obtain information and open-ended questions are advised. However, this approach requires considerable interpersonal skill on the part of the interviewer who may need to probe for details or attitudes that are not expressed overtly. He or she can clarify questions and thereby gain more accurate information. Admittedly, interaction between respondent and interviewer can distort the results but distortion can be partially controlled by training the interviewers and by dividing interviews among several interviewers.[104] If the personal in-depth interview seems the best technique, but if funding is limited, the technique of sequential interviewing may be used. Basically this approach consists of continuing to interview only until repetitive information is being received. This approach is useful in hypothesis generation or pretesting but does not provide representative information.[105] Further, what one gains in any unstructured interview is impressions which may not be readily amenable to analysis or quantification.

The group interview technique takes advantage of interaction among users (8 to 10 is common). With a moderate level of guidance from a facilitator, the subjects are encouraged to discuss their perceptions of the topic in question. A permissive atmosphere created by a skillful moderator and a supportive group can stimulate the expression of ideas and perceptions with a spontaneity not readily obtained in individual interviews. Ideas, for example policy changes that are under consideration by managers, can be suggested by the facilitator and the group's responses, suggested modifications, etc. can be recorded and considered by agency management before finalizing policy.

Group interviews are useful when one wants information about attitudes, beliefs or commonly held values but not about an individual's motivations or behavior. The group interview is not the way to get answers to questions requiring precise detail.

Consideration must also be made for differences in status or expertise level of members of the group and the effects such differences will have on independent thinking and candor. The danger of having conclusions distorted in this way may, however, be partially controlled by using group interviews as preludes to completion of individual questionnaires.[106]

Choice of Sample

Random sampling technique is suitable "whenever large populations are present, innumerable instances that have an outward semblance of homogeneity of structure, a large aggregation of instances that evidence common characteristics,--with these situations, sampling is appropriate."[107] That is, the sample should be chosen such that it reflects in accurate proportion all the relevant characteristics of the total population.

Randomization would be an appropriate way to select respondents for a mailed questionnaire. For example, one might send evaluation forms along with a random sample of bibliography orders. Similarly, the researcher could randomly select users for a brief, semi-structured telephone interview survey. One could, in theory at least, select a random sample of users for person-to-person interviews or even for group interviews. However, travel cost and time constraints make such randomization impractical. It is likely that personal interviewing would have to be done at conferences and the inherent bias accepted. Such bias knowingly accepted and openly acknowledged would probably not be sufficient to invalidate conclusions.

Summary of Information Model

The choice of research method is much affected by factors other than the inherent advantages or disadvantages of a method itself. For example, if skilled facilitators are not available, one would hesitate to arrange group interviews involving travel. Limited funds may force the use of structured telephone survey when a more costly personal interview approach would be more fruitful. Similarly, a hastily designed evaluation form might be used without pre-testing if time is too short for further work on the instrument. The ultimate selection of a survey instrument is then a matter of determining needs, balancing needs against the technical advantages of the various research design options and, finally, considering the technically optimum design in light of the realities of what is available in time, money and human resources. Having compromised, the researcher must acknowledge the limits in his or her work and be open to new evidence which might challenge his or her conclusions.

Of the techniques outlined above, the mailed self-administered structured questionnaire appears to be the most promising technique for use in seeking

feedback on many of DTIC's recurring products which are shipped in considerable numbers such as TAB. A semi-structured questionnaire, either self-administered or administered by telephone interview, might prove a very productive way to gain information on perceptions of non-recurring services or irregularly issued products such as DRIT. The less structured personal interview could prove a very useful approach to take at regional conferences, annual conferences or at other times and places where users might be conveniently gathered together. DTIC users have shown themselves to be interested and articulate observers of the agency and, as a consequence, the group interview technique might be a very effective way to get their input, depending on the availability of a trained facilitator.

PROPOSED DEMAND BIBLIOGRAPHY EVALUATION FORM

The Report (Demand) Bibliography was chosen for the initial survey effort because it is a product clearly central to the DTIC mission. As a consequence, the need for feedback should be clear to an oversight agency. Similarly because the item is tailormade for a particular researcher, it is apparent that only the recipient can evaluate the product's effectiveness. DTIC has no real means to estimate success with this product on an individual or an aggregate level. In addition, DTIC's demand bibliographies are appropriate for study using simple random sampling. This is true because as a collectivity they constitute a generally homogeneous mass of individual units. The randomization process will give DTIC greater assurance that the agency is getting representative feedback.

Justification for Format

The format for the proposed survey instrument is adapted from forms which have been tested through use by DTIC and by NASA. It addresses the central questions of recall and relevance, timeliness of response and impact on DoD research. It does not address factors such as perceived ease of access to the system, or the form of the output product. These are questions that might reasonably be asked but which are not considered central to the analyst's retrieval effort. Similarly it does not inquire into matters such as novelty and perception of backup document delivery capability. These are questions frequently addressed in evaluation studies but not addressed here owing to the specialized nature of the DTIC data bases and collection.

The evaluation form (See Appendix A) begins with an attempt to determine elapsed time between order and receipt of results. Item 4 of the form seeks a statement of the requester's topic in an effort to lea n how broadly or how narrowly and how clearly or how vaguely his topic was defined in his own mind. Knowing how he intended to apply the search helps to further home in on the

question of recall versus relevance as it was defined in the requester's mind. Item 6 asks much the same thing in a slightly different way. Items 5 and 6 may be merged or one of them eliminated in the pre-test process. Item 7 provides an opportunity for an overall evaluation in a familiar scale form that provides for a modera e degree of differentiation. Item 8 again addresses the question of relevance versus recall with a third option to say that the search really went awry. The question on the number of citations (Item 9) is intended to give some sense of whether the recipient found the results sufficient to his purpose regardless of how extensive he believes the extant material to be, whether he still feels the search and/or the literature insufficient for some reason or whether he feels burdened by an excess of material. The tenth question is a straightforward inquiry into the timeliness of the receipt of the product. The eleventh item is intended to find out if the researcher understands that negative results suggest (if not prove) that prior work has not been done in DoD and that zero hits on a topic are not necessarily a fault in the retrieval system. Questions 12-15 are designed to get an estimate of the impact of DTIC's efforts on DoD research. Item 16 is a very rough measure of the evaluator's knowledge of how the DTIC system works. The remaining questions concern user identification and will be used to categorize replies and to follow-up if clarification is needed.

Data Collection

Evaluation data will be solicited by mailing evaluation forms with randomly selected bibliographies. A relatively small sample, perhaps 3% or less, should be adequate if persistent follow-up procedures are maintained. It is recommended that if a completed form is not received within two weeks, then the recipient should be requested by telephone to complete and return the form. If

no reply is received within two weeks of the telephone contact, then a second attempt should be made. If a second call is not effective, the effort should be terminated and the reason recorded. Such follow-up methods will require non-trivial outlay of staff effort. However, taking a small sample should minimize the expenditure of staff time. At any rate, examination of files of completed DTIC Forms 141 suggests that the self-selection factor is strong enough to seriously distort the results yielded by the present approach. Assertive follow-up measures are the only means to control the effects of self-selection.

Data Analysis

There appears to be no requirement for sophisticated statistical analysis of an evaluation of this type. Simple summations of responses and tabulations completed quarterly and cumulated annually should be sufficient to provide a picture of how the Demand Bibliographies are being received and how researchers estimate their impact on the DoD R&D effort. Certain items, i.e., Items 5, 6, 7, 8, 9, 10, 11, 13, and 16 are structured, closed questions and should be easy to record for analysis. An additional category for each item would be added for a non-response to that particular item. Items 2 and 3 would require some calculation on the data analyist's part and may prove not informative enough to continue. Item 4 will probably be difficult to categorize neatly except in terms of a specific statement (e.g., PPBS or anthropometry) versus a less well-defined one (e.g., small arms and aircraft accidents.) Item 12 on how the search will be used should provide examples of how DTIC has made a contribution to the DoD effort. Items 14 and 15 ask the same information as the present DTIC Form 141 and could be analyzed by DTIC-M following present procedures.

RECOMMENDATIONS

DTIC needs to begin at once to develop a coordinated, comprehensive system for obtaining user feedback. Such a system would be highly beneficial to the agency and to users. The process of developing specific survey instruments would force staff members to think more objectively about how well their products and services actually serve the purposes they are intended to serve. Staff would be encouraged to consider, step by step, the various processes they go through to achieve their goals. This careful consideration of work processes would enable staff members to see better ways to do their jobs.

Systematic ongoing effort to obtain feedback would signal to users that DTIC recognizes the dynamic nature of information needs in research and development. Further, such an effort would tell the user community that the agency acknowledges the value of its users' expertise in assessing those changing needs. If users recognize that they have been given a positive role in DTIC's decision-making process, they will then take a more direct interest in the success of the agency.

Having the recommended input from users would provide agency managers with practical planning information. Planners would be advised of the specific characteristics users want in products and services. They would also be alerted to areas where user training is particularly needed. Similarly, reviewing the results of surveys over a number of years would enable planners to more accurately project long-range trends in user needs.

A user survey system, such as the one recommended here, would provide managers with persuasive evidence to use in their efforts to justify funding for

agency programs. The existence of a set of carefully designed user surveys would confirm the fact that agency managers are not concerned just with maintaining the organization per se. It would demonstrate that managers have their attention focused on mission accomplishment, that is, on efficiently and effectively meeting the actual information needs of the defense scientific and technical community. The findings of the survey system would constitute evidence from outside the agency that users find DTIC products and services valuable. Such evidence of the agency's positive impact on defense research and development would suggest that an expanded and enhanced program would produce even greater benefits.

It is recommended that DTIC take the following actions to develop and implement a systematic, coordinated program for obtaining user feedback:

1. DTIC should develop a set of self-administered, mostly structured questionnaires to be mailed with certain products shipped in considerable numbers on a regular basis, e.g., demand bibliographies and hard copies of documents. These product shipments should be susceptible to the randomization process. The sample should be large enough to be statistically defensible, but no larger in order to minimize costs. Aggressive follow-up should be maintained. Personnel costs for development, distribution, follow-up, recordkeeping, data analysis and reporting would range from $5900 to $7300 during the first year. Appendix C shows cost estimates for different categories of personnel effort to implement these recommendations.

2. DTIC should develop a self-administered essentially structured questionnaire covering a number of non-recurring services and recurring products and services not covered by individual evaluation forms, e.g., DRIT. These questionnaires should be sent to a small sample of randomly selected user codes and follow-up measures completed. It is recommended that this be done annually. Personnel costs for the first year are estimated to range between $2600 and $3250 (see Appendix C).

3. DTIC should develop a set of loosely structured personal interview schedules to be followed in obtaining feedback from attendees at user conferences. These interview schedules should be flexible enough to accommodate changing technological and organizational conditions. At the same time, they should be sufficiently structured to make longitudinal comparison possible. The sample of interviewees should be chosen at random from conference confirmations. However, the element of self-selection will be inescapable because attendees at user conferences will tend to be the more active and interested users of DTIC products and services.

Nevertheless, the perceptions of such users do matter and they should be measured in a way that makes year-to-year comparison possible. Personnel costs would range between $1900 and $2400 (see Appendix C).

4. DTIC should develop a method to analyze user conference minutes to identify and categorize issues in such a way that trends from year-to-year can be noted and recorded as such. Certain of the conference sessions seem to be much like over-sized group interviews and perhaps similar group dynamics are at work. At any rate, costs would be limited to the costs of the analyst's time and OMB clearance would not be necessary. Costs of the analyst's effort should range between $400 and $500 (see Appendix C).

Staff members who produce the product or service to be evaluated should participate in all stages of any attempt to develop a feedback mechanism. This is essential to gain their substantive input for development of the surveys and to gain their cooperation in carrying through the project. Plans for population selection, data collection, and analysis must be constructed so as to be defensibe if questioned by OMB. All survey instruments should be pre-tested in the Washington, D.C., area with DoD subjects and nine or fewer contractors. The final survey instruments should incorporate the changes suggested by the pre-testing. The final package must be ready for incorporation in the DLA Information Collection Budget in May. Results of all surveys should be made known to users via appropriate announcement media.

DTIC would derive substantial benefits from implementation of the recommended program. Such a program should not, however, be viewed as static. It would require periodic re-examination to take account of changes in the agency and in its user community.

APPENDIX A

DTIC BIBLIOGRAPHY EVALUATION	DATE

INSTRUCTIONS TO THE USER: This form is enclosed in DTIC Report Bibliographies and Data Bank Summary Reports. The objective is to obtain information for improvement of DTIC Retrieval Services to customers. The evaluation should be completed by the principal user of the information. Return to DTIC within five working days, if possible.

1. SEARCH SUBJECT:

2. SEARCH CONTROL NUMBER:	3. DATE REQUESTED:	4. DATE RECEIVED:

5. OVER-ALL RETRIEVAL EVALUATION *(Check appropriate block)*

☐ EXTREMELY VALUABLE ☐ VALUABLE ☐ SATISFACTORY ☐ UNSATISFACTORY

6. IF RESULTS WERE NEGATIVE, WAS KNOWLEDGE OF THIS FACT BENEFICIAL?	☐ YES ☐ NO

BASIS FOR THE ABOVE EVALUATION *(Please specify)*:

7. DID YOU CITE ALL POSSIBLE IDENTIFICATION OF THE DESIRED INFORMATION?	☐ YES ☐ NO

IF ANSWER IS NO, PLEASE LIST OTHER IDENTIFYING INFORMATION *(Please specify)*:

DO YOU DESIRE ANOTHER SEARCH USING THIS INFORMATION?	☐ YES ☐ NO
8. WAS THE SEARCH PRODUCT BENEFICIAL TO YOUR RESEARCH OR DEVELOPMENT EFFORT?	☐ YES ☐ NO

A. IF ANSWER IS YES, WAS THE SEARCH BENEFICIAL IN THE SAVINGS OF TIME?
ESTIMATED AMOUNT _____
(e.g., MAN-HOURS SAVED IN INFORMATION SEARCH TIME, MAN-HOURS SAVED IN AVOIDANCE OF WORK DUPLICATION)

B. IF ANSWER IS YES, WAS THE SEARCH BENEFICIAL IN SAVINGS OF MONEY?
ESTIMATED AMOUNT _____
(e.g., DOLLAR VALUE OF SAVINGS IN INFORMATION SEARCH TIME; DOLLAR VALUE OF WORK NOT DUPLICATED, ETC.)

9. IS THIS YOUR FIRST REQUEST FOR A DTIC BIBLIOGRAPHY?	☐ YES ☐ NO

10. USER ORGANIZATION:	11. USER CODE:
12. REQUESTER'S NAME AND TITLE:	13. TELEPHONE NUMBER:

DTIC FORM 141 SEP 80 (FRONT)

PREVIOUS EDITIONS ARE OBSOLETE

(Staple Here)

(Fold On Broken Lines)

DEFENSE TECHNICAL INFORMATION CENTER
ATTN: OFFICE OF PLANNING & MANAGEMENT (DTIC-MP)
CAMERON STATION
ALEXANDRIA, VIRGINIA 22314

(Reverse)

DTIC BIBLIOGRAPHY EVALUATION	DATE

INSTRUCTIONS TO THE USER: *This form is enclosed in DTIC Report Bibliographies and Data Bank Summary Reports. The objective is to obtain information for improvement of DTIC Retrieval Services to customers. The evaluation should be completed by the principal user of the information. Return to DTIC within five working days, if possible.*

1. SEARCH SUBJECT:

2. SEARCH CONTROL NUMBER:	3. DATE REQUESTED:	4. DATE RECEIVED:

5. OVER-ALL RETRIEVAL EVALUATION *(Check appropriate block)*

☐ EXTREMELY VALUABLE ☐ VALUABLE ☐ SATISFACTORY ☐ UNSATISFACTORY

6. IF RESULTS WERE NEGATIVE, WAS KNOWLEDGE OF THIS FACT BENEFICIAL?	☐ YES ☐ NO

BASIS FOR THE ABOVE EVALUATION *(Please specify)*:

7. DID YOU CITE ALL POSSIBLE IDENTIFICATION OF THE DESIRED INFORMATION?	☐ YES ☐ NO

IF ANSWER IS NO, PLEASE LIST OTHER IDENTIFYING INFORMATION *(Please specify)*:

DO YOU DESIRE ANOTHER SEARCH USING THIS INFORMATION?	☐ YES ☐ NO
8. WAS THE SEARCH PRODUCT BENEFICIAL TO YOUR RESEARCH OR DEVELOPMENT EFFORT?	☐ YES ☐ NO

A. IF ANSWER IS YES, WAS THE SEARCH BENEFICIAL IN THE SAVINGS OF TIME?
ESTIMATED AMOUNT _____
(e.g., MAN-HOURS SAVED IN INFORMATION SEARCH TIME, MAN-HOURS SAVED IN AVOIDANCE OF WORK DUPLICATION)

B. IF ANSWER IS YES, WAS THE SEARCH BENEFICIAL IN SAVINGS OF MONEY?
ESTIMATED AMOUNT _____
(e.g., DOLLAR VALUE OF SAVINGS IN INFORMATION SEARCH TIME; DOLLAR VALUE OF WORK NOT DUPLICATED, ETC.)

9. IS THIS YOUR FIRST REQUEST FOR A DTIC BIBLIOGRAPHY?	☐ YES ☐ NO

10. USER ORGANIZATION:	11. USER CODE:
12. REQUESTER'S NAME AND TITLE:	13. TELEPHONE NUMBER:

DTIC FORM SEP 80 141 (FRONT) 45 PREVIOUS EDITIONS ARE OBSOLETE

BIBLIOGRAPHY EVALUATION

APPENDIX B

INSTRUCTIONS TO THE USER: This form is enclosed in DTIC Report Bibliographies and Data Bank Summary Reports. The objective is to obtain information for improvement of DTIC Retrieval Services to customers. The evaluation should be completed by the principal user of the information. Return to DTIC within five working days, if possible.

A. IDENTIFICATION

1 SEARCH CONTROL NUMBER:	2 DATE REQUESTED:	3 DATE RECEIVED:

4 SEARCH SUBJECT

5 WHAT DID YOU EXPECT TO GAIN FROM THE SEARCH? *(Check one)*

- ☐ a. BACKGROUND INFORMATION
- ☐ b. INTRODUCTORY READING MATERIAL
- ☐ c. SPECIFIC INFORMATION
- ☐ d. BIBLIOGRAPHY FOR PUBLICATION
- ☐ e. CURRENT STATE-OF-THE-ART
- ☐ f. OTHER *(Specify)* _____

6 TYPE OF SEARCH WANTED *(Check one)*

- ☐ a. BROAD RETROSPECTIVE SEARCH *(A general survey)*
- ☐ b. INTENSIVE SEARCH ON A SPECIFIC QUESTION OR TOPIC
- ☐ c. OTHER *(Specify)* _____

B. QUALITY

7 WHAT IS YOUR OVERALL EVALUATION OF THIS SEARCH ON THE FOLLOWING SCALE? *(Check one)*

VERY USEFUL		USEFUL		OF LITTLE USE		OF NO USE
☐ 7	☐ 6	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1

8 DID YOU FIND THE SEARCH TO BE: ☐ a. COMPREHENSIVE ☐ b. INTENSIVE ☐ c. NEITHER COMPREHENSIVE NOR INTENSIVE

9 THE NUMBER OF CITATIONS WAS: ☐ a. SATISFACTORY ☐ b. TOO SMALL ☐ c. TOO LARGE

10 DID YOU RECEIVE THE SEARCH IN TIME TO MEET YOUR NEEDS? ☐ a. YES ☐ b. NO

11 IF RESULTS WERE NEGATIVE, WAS KNOWLEDGE OF THIS FACT BENEFICIAL? ☐ YES ☐ NO

C. APPLICATION

12 HOW ARE YOU GOING TO USE THIS SEARCH?

13 WAS THE SEARCH PRODUCT BENEFICIAL TO YOUR RESEARCH OR DEVELOPMENT EFFORT? ☐ YES ☐ NO

14 IF ANSWER IS YES, WAS THE SEARCH BENEFICIAL IN THE SAVINGS OF TIME?
ESTIMATED AMOUNT _____
(e.g., MAN HOURS SAVED IN INFORMATION SEARCH TIME, MAN HOURS SAVED IN AVOIDANCE OF WORK DUPLICATION)

15 IF ANSWER IS YES, WAS THE SEARCH BENEFICIAL IN SAVINGS OF MONEY?
ESTIMATED AMOUNT _____
(e.g., DOLLAR VALUE OF SAVINGS IN INFORMATION SEARCH TIME; DOLLAR VALUE OF WORK NOT DUPLICATED, ETC.)

16 IS THIS YOUR FIRST REQUEST FOR A DTIC BIBLIOGRAPHY? ☐ YES ☐ NO

17 USER ORGANIZATION:	18 USER CODE:
	19 DATE
20 REQUESTER'S NAME AND TITLE:	21 TELEPHONE NUMBER:

APPENDIX C

COST ESTIMATE FOR RECOMMENDATION NUMBER ONE

DEMAND BIBLIOGRAPHY EVALUATION FORM

Developmental costs		
Coordination with retrieval analysts	GS11/32hrs	$384
Design form	GS11/24hrs	288
Pre-test form	GS11/24hrs	288
Design coding sheets	GS11/08hrs	96
Set-up filing system	GS11/04hrs	48
.....	total =	1104
Distribution, recordkeeping, and follow-up		
Assign random numbers to bibliographies	GS09/03hrs	30
Insert forms with bibliographies	GS05/68hrs	442
Distribution notice to DTIC-V	GS05/34hrs	221
File distribution notices	GS05/34hrs	221
Match distributions/returns	GS09/34hrs	340
ID subjects for follow-up	GS09/34hrs	340
1st follow-up calls (327 on 20% rtn rate)	GS11/55hrs	660
File 1st follow-up returns	GS05/34hrs	221
2nd follow-up calls (111 on 66% rtn rate)	GS11/19hrs	228
File 2nd follow-up returns	GS05/34hrs	221
.....	total =	2924
Data analysis and reporting		
Code data from 80% return	GS11/109hrs	1308
Analysis	GS11/ 16hrs	192
Write report	GS11/ 24hrs	288
.....	total =	1788

COST ESTIMATES SUMMARIZED	LOW - HIGH
Developmental	1100 - 1375
Distribution, recordkeeping, follow-up	3000 - 3750
Data analysis and reporting	1800 - 2250
. . . . . total =	5900 - 7375

Estimate is based on the number of bibliographies shipped in 1982:

TR 9047 x .03 sample = 271
WUIS 3009 x .04 sample = 120
IR&D 451 x .04 sample = 18

COST ESTIMATE FOR RECOMMENDATION NUMBER TWO

NON-RECURRING PRODUCTS/SERVICES EVALUATION FORM		
Developmental costs		
Design/coordinate form	GS11/60hrs	$720
Pre-test form	GS11/24hrs	288
.....total =		1008
Distribution		
Assign random numbers	GS09/02hrs	20
Produce labels/mailing	GS05/03hrs	19
.....total =		39
Follow-up procedures		
1st follow-up call (84 on 20% rtn rate)	GS11/42hrs	504
2nd follow-up call (40 users)	GS11/20hrs	240
Remail 15% of forms (16)	GS09/01hrs	10
	GS05/01hrs	6
.....total =		760
Analysis and reporting		
Receive and file returns (est. 89)	GS09/15hrs	150
Analysis of 89 forms	GS11/45hrs	540
Write report	GS11/12hrs	144
.....total =		834
COST ESTIMATES SUMMARIZED		LOW - HIGH
Developmental		1000 - 1250
Distribution and follow-up		800 - 1000
Analysis and reporting		800 - 1000
.....total =		2600 - 3250

Estimate is based on the number of DTIC users (3512) as of November, 1982 and a 3% sample of 105 user codes.

COST ESTIMATE FOR RECOMMENDATION NUMBER THREE

PERSONAL INTERVIEW SCHEDULE

Developmental costs		
Design schedule	GS09/40hrs	$400
Pre-test schedule	GS09/24hrs	240
Train 2nd interviewer	GS11/08hrs	96
	GS09/08hrs	80
.....	total =	816
Administration of schedule		
Select subjects	GS11/02hrs	24
Call prospective subjects	GS11/12hrs	144
Confirmation calls to subjects	GS11/12hrs	144
Interviews (24)	GS09/12hrs	120
	GS11/12hrs	144
.....	total =	576
Analysis and reporting		
Consultation (2 interviewers)	GS09/02hrs	20
	GS09/02hrs	24
Data analysis	GS09/12hrs	120
	GS11/12hrs	144
Write report	GS11/24hrs	288
	total =	596

COST ESTIMATES SUMMARIZED	LOW - HIGH
Developmental costs	800 - 1000
Administration of schedule	575 - 720
Data analysis and reporting	600 - 750
	1975 - 2470

Estimate is based on 275 attendees at the 1982 conference. Interviews with 24 subjects are recommended.

COST ESTIMATE FOR RECOMMENDATION NUMBER FOUR

ANALYSIS OF USER CONFERENCE MINUTES

Developmental costs		
Examine minutes and categorze issues	GS09/12hrs	$120
Design coding sheet	GS09/12hrs	120
Write report	GS09/16hrs	160
.....	total =	400

COST ESTIMATE SUMMARIZED	LOW - HIGH
Development and reporting	400 - 500

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DTIC